What is claimed is:

1. An actuator, comprising:

a housing and a motor and wave gear reduction drive disposed adjacently within the housing along a center axis of the housing;

the wave gear reduction drive including a circular, rigid internal gear, a circular, flexible external gear that is capable of radial elastic displacement, and a wave generator that radially displaces the flexible external gear into partial engagement with the rigid internal gear while circumferentially rotating points of the partial engagement;

the flexible external gear including a cylindrical body portion that is capable of radial elastic displacement, an annular diaphragm that extends radially inward or outward from an end of the body portion, and a boss formed as a continuous part of an inner or outer edge of the diaphragm;

the wave generator including a rigid cam plate and a bearing with inner and outer rings capable of radial elastic displacement disposed on the peripheral surface of the cam plate, with the cam plate being driven to rotate by the motor;

the motor having a rotational shaft that includes a motor shaft portion to which a rotor is attached and an extended shaft portion that extends from an end of the motor shaft portion towards the wave gear reduction drive, the wave generator cam plate being formed integrally on the peripheral surface of the extended shaft portion; and

sandwiching the portion at which the cam plate is integrally formed, the motor shaft portion of the rotational shaft being rotatably supported in the housing via a first bearing, and the wave gear reduction drive end of the rotational shaft being rotatably supported by the flexible external gear boss via a second bearing.

2. The actuator according to claim 1, wherein an internal partition separates the housing into a space where the motor is installed and a space where the wave gear reduction drive is installed.

3. The actuator according to claim 2, wherein the rigid internal gear and partition are an integrally formed single component.

4. The actuator according to claim 1, 2 or 3, wherein the flexible external gear is of a cup shape having the annular diaphragm that extends radially inward from an end of the body portion and the boss that is formed as a continuous part of the inner edge of the diaphragm, and the second bearing is supported by an annular bearing holder attached to the boss.

5. The actuator according to claim 1, 2, 3 or 4, wherein the rotational shaft has a second extended shaft portion that extends from the other end of the motor shaft portion, with the encoder being attached to the second extended shaft portion.

6. The actuator according to any of claims 1 to 5, wherein the rotational shaft is hollow and the flexible external gear boss is provided with a through-hole that is concentric with the hollow shaft.